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Scientific study of Vedic Knowledge Agnihotra

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Objective:

To study effect of Agnihotra fumes on:

1. **Expt No: 1**: Microbial count in the surrounding air
2. **Expt No: 2**: plant growth
3. **Expt No: 3**: NO_2 level
4. **Expt No: 4**: SO_2 level

To study effect of Agnihotra ash on:

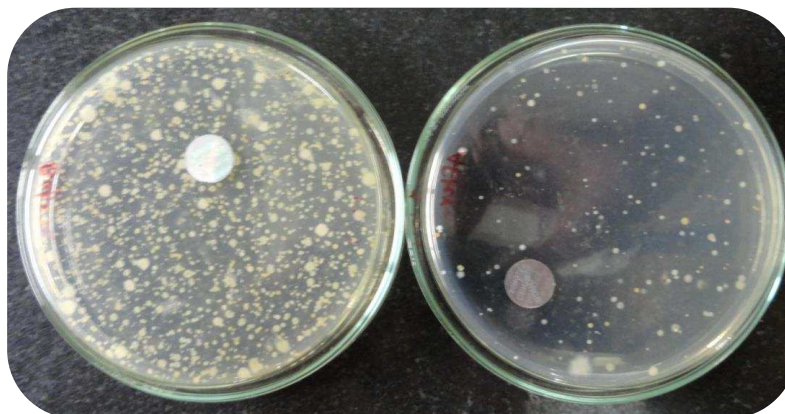
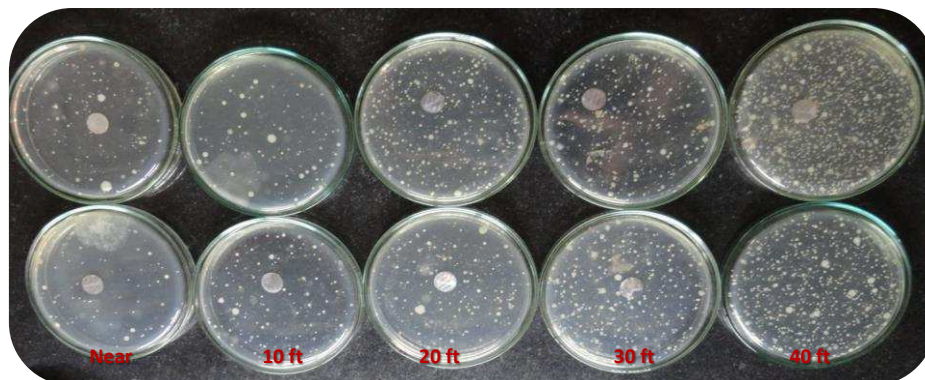
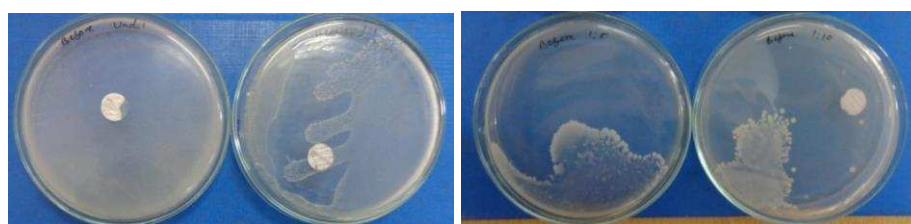
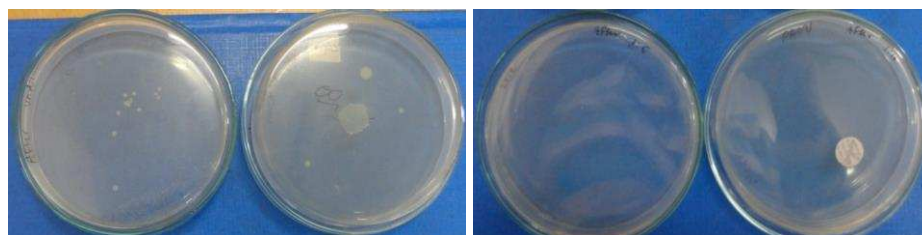
1. **Expt No: 5**: Skin disease of animal and humans.
2. **Expt No: 6**: Seed germination
3. **Expt No: 7**: Genotoxic chemicals (colchicine and methyl parathion)
4. **Expt No: 8-11**: Bacterial pathogenecity.
5. **Expt No: 12**: Water purification using Agnihotra ash

Study of different components in Agnihotra:

1. **Expt No: 13**: Time- sunrise time, sunset time and any time (between sunrise and sunset)
2. **Expt No: 14**: Mantra- with mantra (sunrise and sunset) and without mantra
3. **Expt No: 15**: Rice- brown rice (unpolished) and white rice (polished)
4. **Expt No: 16**: Ghee- cow ghee and buffalo ghee
5. **Expt No: 17**: Pot- copper pot and steel pot of same size and shape

TO STUDY EFFECT OF AGNIHOTRA FUMES

Expt No: 1: **Microbial count in the surrounding air**

- Medium (nutrient agar) plates were open in room before and after Agnihotra and incubated for 24 hr at room temperature to grow bacterial colonies.
- Also plates were opened 0, 10, 20, 30, 40 feet apart from Agnihotra and colony count was taken after 24 hr incubation at room temperature.

Before After

- Known amount of air sample is collected in sterile 35 ml nutrient medium, before and after Agnihotra. Sample was diluted as undiluted, 1:1, 1:5 and 1:10. Diluted sample were spread on nutrient agar plates and incubated for 30 hr. to grow bacterial colonies.

Before Agnihotra

After Agnihotra

Conclusion-
As per results obtained, Agnihotra fumes decreases microbial load in air.
Up to 30 feet microbial load in the air can be control by performing Agnihotra.

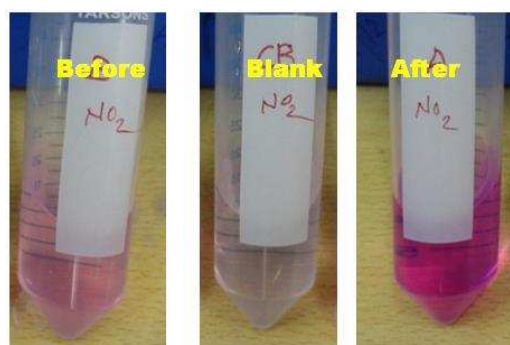
Expt No: 2: To study effect of Agnihotra fumes on plant growth
2 plants were maintained providing same amount of water, light and other environmental conditions. One is kept in separate room where Agnihotra is performed and another is kept in normal room where Agnihotra is not performed.

Yoga is source of Knowledge

Conclusion-

It shows that due to Agnihotra fumes plant growth is more as compare to normal plant.

Expt No: 3: Effect of Agnihotra fumes on NO_2 level

NO_2 in air is collected by scrubbing a known volume of air through an alkaline solution of arsenite. The nitrite ions thus formed is reacted with sulfanilamide and N-(1-naphthyl) ethylenediamine (NEDA) in phosphoric acid to form the colored azo dye, which can be measured on spectrophotometer at 540 nm. The method is standardized statistically by using $NaNO_2$ standards. Standardization is based upon the empirical observation that 0.74 mole of $NaNO_2$ produces same color as 1 mole of NO_2. SO_2 can be removed using H_2O_2.

Calculations for sample before Agnihotra-

1. O.D. at 540 nm = 0.104
2. µg of NO_2/ml from graph = 0.1644 µg /ml
3. volume of air sampled
   $V = (F1+F2)/2 \times T \times 10^{-3}$
   Flow rate = 1.5 ml/min
   Time of sampling = 2 hr = 120 min
   $V= (1.5+1.5)/2 \times 120 \times 10^{-3}$
   $V= 0.18\ m^3$
4. level of NO_2
   = (µg of NO_2/ml × volume of absorbing reagent)/ 0.85 × V
   = (0.1644 × 15) / 0.85 ×0.18
   = **16.1152 µg /m^3**
5. NO_2 in ppm = level of $NO_2 \times 5.32 \times 10^{-4}$
   = **0.00857 ppm**

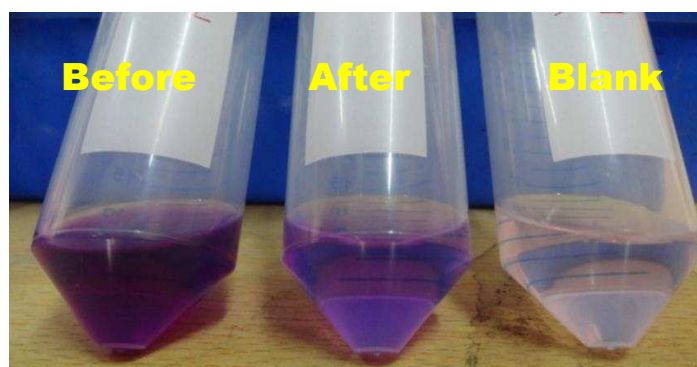
Calculations for sample after Agnihotra-

1. O.D. at 540 nm = 0.122
2. µg of NO_2/ml from graph = 0.1928 µg /ml
3. volume of air sampled
   $V = (F1+F2)/2 \times T \times 10^{-3}$
   Flow rate = 1.5 ml/min
   Time of sampling = 2 hr = 120 min
   $V= (1.5+1.5)/2 \times 120 \times 10^{-3}$
   $V= 0.18\ m^3$
4. level of NO_2
   = (µg of NO_2/ml × volume of absorbing reagent)/ 0.85 × V
   = (0.1928 × 15) / 0.85 ×0.18

= **17.6471 μg /m³**

5. NO_2 in ppm = level of $NO_2 \times 5.32 \times 10^{-4}$
   = **0.00939 ppm**

Expt No: 4: Effect of Agnihotra fumes on SO_2 level

SO_2 from the air stream is absorbed in a sodium tetra-chloromercurate solution, it forms a stable dichloro sulpho mercurate complex, which then behaves effectively as fixed SO_3^{-2} in solution. The amount of SO_2 is then estimated by the color produced when p-rosailine-hydrochloride and formaldehyde is added in solution, which can be measured on spectrophotometer at 560 nm.

Calculations for sample before Agnihotra-

1. O.D. at 560 nm = 0.203
2. μg of SO_2/ml from graph = 0.2589 μg /ml
3. volume of air sampled
   $V = (F1+F2)/2 \times T \times 10^{-3}$
   Flow rate = 1.5 ml/min
   Time of sampling = 2 hr = 120 min
   $V= (1.5+1.5)/2 \times 120 \times 10^{-3}$
   $V= 0.18\ m^3$
4. SO_2 in ppm = (μg of SO2 per ml from graph) / volume of air sampled
   = 0.2589 / 0.18
   = **1.4381 ppm**
5. μg /m³ of SO_2 = (ppm of SO2 × 64 ×10^6) / 24470
   = 3761.34
6. SO_2 (μg /m³) at 25 °C and 760 mm(Hg) = μg /m³ of SO_2 × volume of absorbing reagent
   = 3761.34 × 15
   = **5.642×10^4 μg /m³**

Calculations for sample after Agnihotra-

1. O.D. at 560 nm = 0.079
2. μg of SO_2/ml from graph = 0.1007 μg /ml
3. volume of air sampled
   $V = (F1+F2)/2 \times T \times 10^{-3}$
   Flow rate = 1.5 ml/min
   Time of sampling = 4 hr = 120 min
   $V= (1.5+1.5)/2 \times 120 \times 10^{-3}$
   $V= 0.18\ m^3$
4. SO_2 in ppm = (μg of SO_2 per ml from graph) / volume of air sampled

= 0.1007 / 0.18
= **0.5597 ppm**

5. $\mu g/m^3$ of SO2 = (ppm of $SO_2 \times 64 \times 10^6$) / 24470
   = 1463.77
6. SO_2 ($\mu g/m^3$) at 25 ^oC and 760 mm(Hg) = $\mu g/m^3$ of SO_2 × volume of absorbing reagent
   = 1463.77 × 15
   = **2.1957×10^4 μg /m³**

Results-

NO_2 level in the surrounding atmosphere is increased from 0.0086 ppm to 0.0094 ppm due to Agnihotra fumes (performed at sunset).

SO_2 level in atmosphere reduces from 1.44 ppm to 0.56 ppm due to Agnihotra fumes (performed at sunset).

To study effect of Agnihotra ash on

Expt No: 5: Effect of Agnihotra ash on skin disease of animal and humans.

Agnihotra ash was mixed with pure ghee to make an ointment which was applied to the infected ear (showing red rashes) of pet cat as well as to the infected thumb (showing peeled off skin with wound) of a lady ,whose hand comes in touch with detergent and water everyday because of washing and cleaning the vessels and the clothes.
After one month of treatment (3times/day) with the above mixture cat's ear became totally normal in comparison with the control (only ghee), whereas the thumb infection did not disappear totally but appears to be recovered compared to the control.

Conclusion: Agnihotra ash can be used to make **ointment** to treat skin diseases**.**

Expt No: 6: Effect of Agnihotra ash on seed germination-

To study effect of Agnihotra ash on germination of seeds, following water were used-

a. tap water,
b. control ash water (1 gm normal ash + 100 ml water) and
c. Agnihotra ash water (1 gm Agnihotra ash + 100 ml water)

Seeds of *Vigna aconitifolia* and *Vigna unguiculata* were taken as experimental material. Seeds were allowed to germinate and germination was observed every after 24 hrs.

Observations-

Tap water **control ash** **Agnihotra ash**

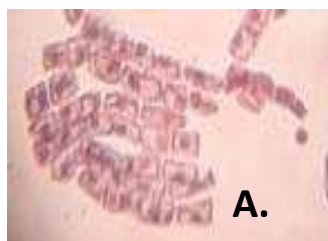
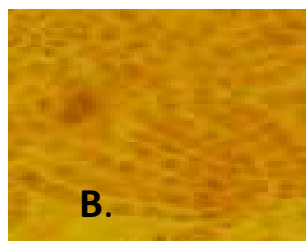
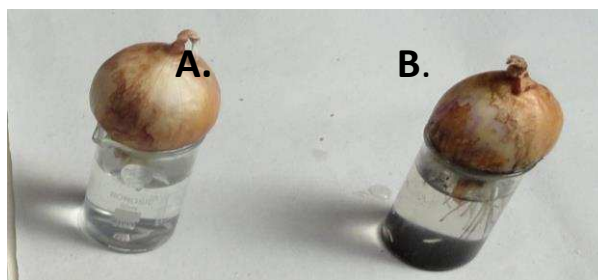
Conclusion-

From results obtained it can be concluded that Agnihotra ash promoted the process of germination probably by increasing its nutrient content and hence can be used as **fertilizer**.

Expt No: 7: To study neutralization of genotoxic effect by Agnihotra ash-

To study neutralization of genotoxic effect by agnihotra ash onion root tips were used. The Onion roots were allowed to grow separately in

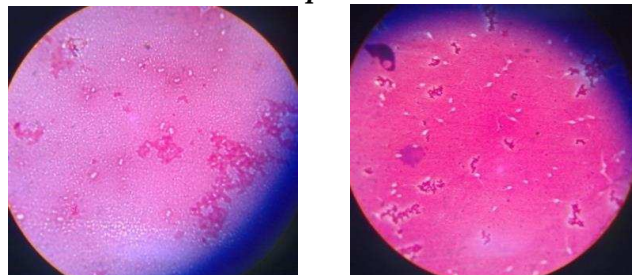
- tap water,
- water containing Agnihotra ash,
- water containing control ash,
- water containing Colchicine
- Water containing Colchicine and agnihotra ash.
- water containing Methyl Parathion
- Water containing Methyl Parathion and agnihotra ash.

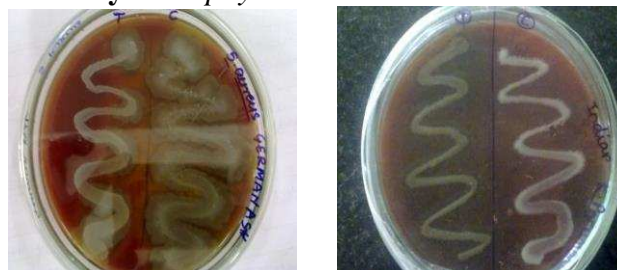
- Growth of roots was measured in cm. after 7 days. Root tips from each sample were taken and different stages of Mitosis were observed.
- Arresting of mitosis (no spindle formation) and small growth (rigorous) of root tips were taken as toxic effect, while normal mitosis and elongated root tip taken as normal growth or non-toxic.

A. Containing genotoxic chemical (colchicine)
B. Containing genotoxic chemical (colchicine) + Agnihotra ash.

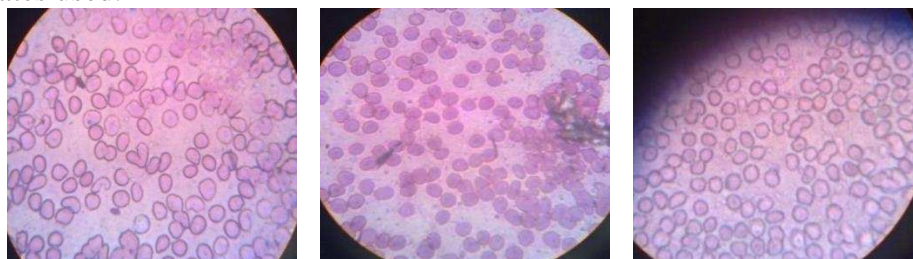
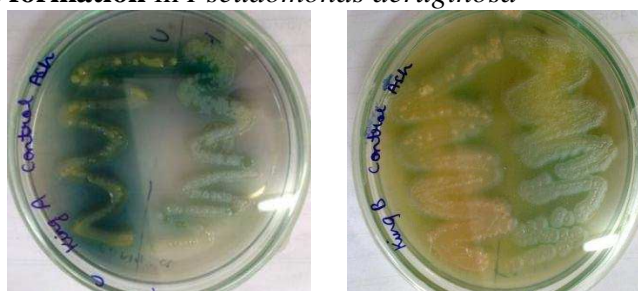
Conclusion-

Agnihotra ash showed activating effect on cell division and also neutralises toxic effect of Colchicine and Methyl Parathion.

Expt No: 8-11: Effect of Agnihotra ash on bacteria.
The Bacteria selected were Pathogenic as well as some commensal and non pathogenic, were exposed to Agnihotra Ash and observed for changes in the properties like

Expt No: 8: Loss of Capsule formation in *Klebsiella pneumonia*

It is evident from Table that upon exposure to Agnihotra ash the capsule forming ability of *Klebsiella pneumoniae was* reduced.

Expt No: 9: Loss of haemolytic activity in *Staphylococcus aureus and Klebsiella pneumonia*

Haemolytic ability of *K. pneumonia*e and *S. aureus* was reduced upon exposure to Agnihotra ash.

Expt No: 10: Decreased resistance to phagocytosis,
Human blood 5ml + 0.5 ml bacterial suspension, incubate at 37^0C for 1 hr and blood stain it observe cell no engulfed (use direct bacteria and also exposed to Agnihotra ash for 1 hr)
Decreased resistance to phagocytosis (more no of bacteria engulfed by phagocytes) was observed for all the four Bacterial isolates used.

Expt No: 11: Loss of pigment formation in *Pseudomonas aeruginosa*

Pigment production ability of *Pseudomonas aeruginosa* was reduced upon exposure (use direct bacteria and also exposed to Agnihotra ash for 1 hr)to Agnihotra Ash.

Expt No: 12: Water Purification using Agnihotra ash:

1. 1 L tap water + 10ml sewage (for coliform contamination) (positive control) : sample A
2. 1 L tap water (negative control)
3. sample A water 100 ml + 5 gm Agnihotra ash, incubate at overnight at RT and then perform MPN

Results- Sample A showed MPN positive, while tap water and ash treated sewage mixed water showed MPN negative

Conclusion- Agnihotra ash removes water pathogens and purifies it.

Study of different ingredients in Agnihotra-

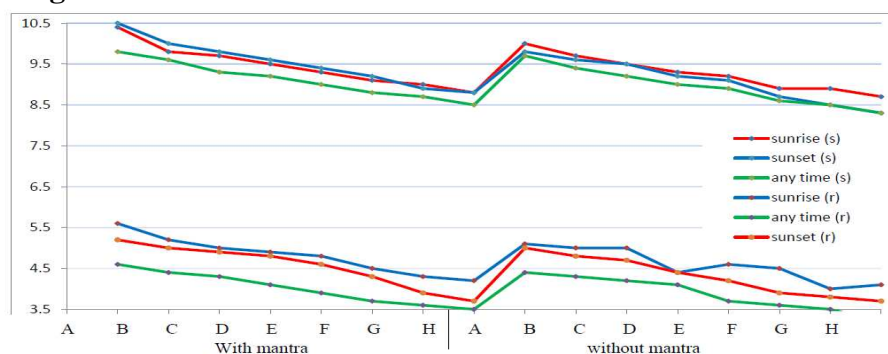
To study the effect of time, mantra, rice, ghee and pot on Agnihotra ash we used following parameters-

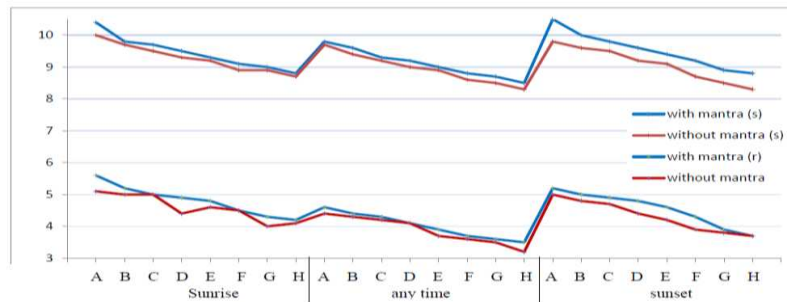
1. **Expt No: 13**: Time- sunrise time, sunset time and any time (between sunrise and sunset)
2. **Expt No: 14**: Mantra- with mantra (sunrise and sunset) and without mantra
3. **Expt No: 15**: Rice- brown rice (unpolished) and white rice (polished)
4. **Expt No: 16**: Ghee- cow ghee and buffalo ghee
5. **Expt No: 17**: Pot- copper pot and steel pot of same size and shape

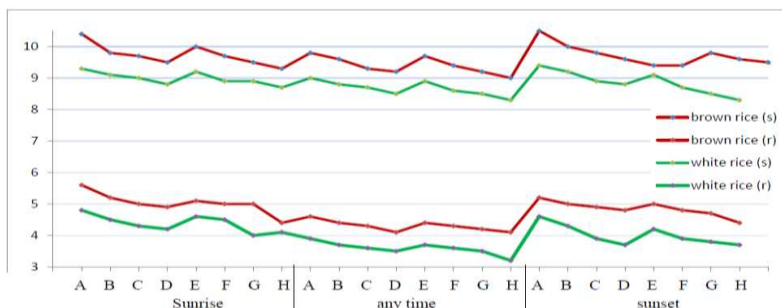
We prepare 48 ashes with combinations of different parameters such as time, mantra, rice, ghee and pot. Moong (*Vigna aconitifolia)* seeds were allowed to grow in respective 48 ashes, providing same environmental conditions and after 2 weeks plant growth was measured by considering shoot and root length.

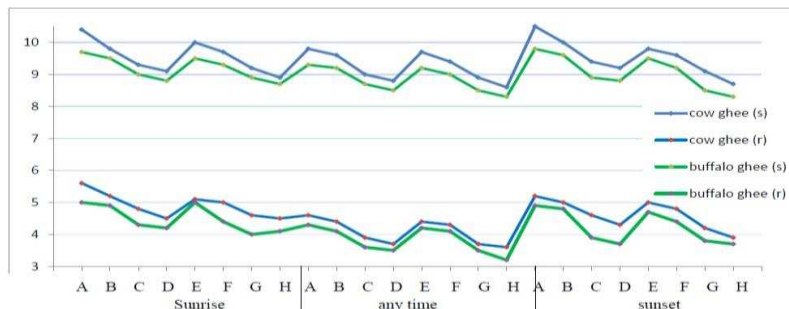
- Plant growth in all 48 ashes is **more** as compare to control.
- Graphs for different parameters are created using following A to H ashes-
    A. Brown rice, cow ghee, copper pot
    B. Brown rice, cow ghee, steel pot
    C. Brown rice, buffalo ghee, copper pot
    D. Brown rice, buffalo ghee, steel pot
    E. white rice, cow ghee, copper pot
    F. white rice, cow ghee, steel pot
    G. white rice, buffalo ghee, copper pot
    H. white rice, buffalo ghee, steel pot

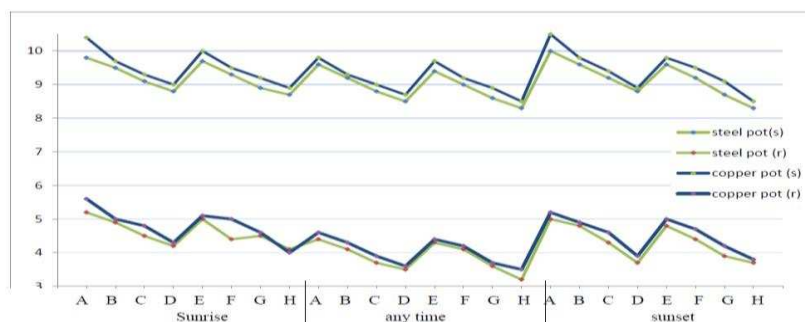
Results-

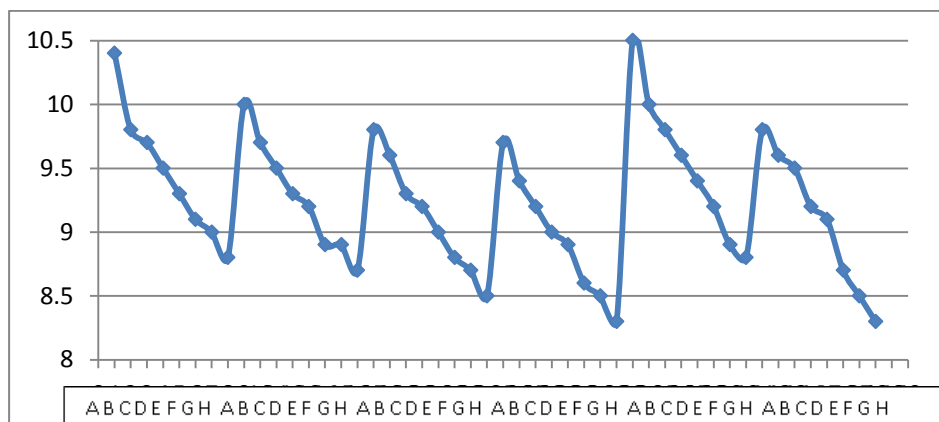
1. Effect of time on Agnihotra

Plant growth is more in sunrise (blue line) and sunset (red line) ashes as compare to any time (green line) ashes. Also root growth is more in sunrise ashes than in sunset ashes.

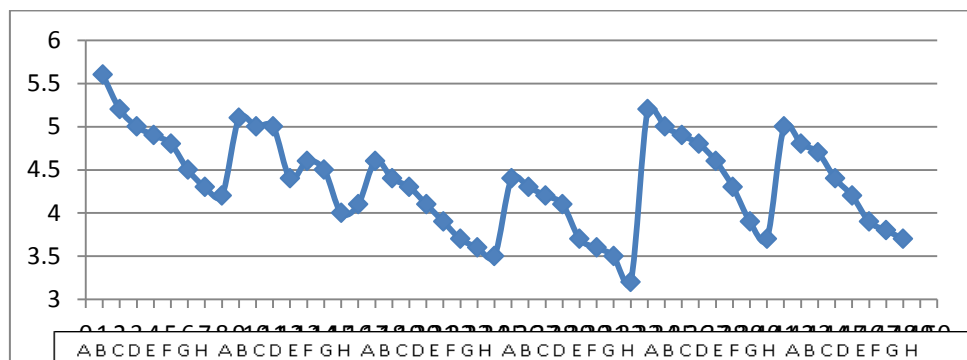
2. **Effect of mantra on Agnihotra-**

As per graph, we can conclude that plant growth in ashes with mantra (blue lines)is more as compare to plant growth in ashes without mantra (red lines).

3. **Effect of rice on Agnihotra-**

As per graph, we can conclude that plant growth in ashes with brown or unpolished rice (red lines) is more as compare to plant growth in ashes with white or polished rice (green lines).

4. **Effect of ghee on Agnihotra-**

Plant growth in ashes with cow ghee (blue lines) is more as compare to plant growth in ashes with buffalo ghee (green lines).

5. **Effect of pot on Agnihotra-**

Plant growth in ashes prepared in copper pot (blue lines) is more as compare to plant growth in ashes prepared in steel pot (green lines).

6. Combine effect of rice, ghee and pot on shoot length-

As per graph combine effect of brown rice, cow ghee and copper pot (points A) shows more shoot growth as compare to other (i.e. B to H). It shows peak at 'A' point.

7. Combine effect of rice, ghee and pot on root length-

As per graph combine effect of brown rice, cow ghee and copper pot (points A) shows more root growth as compare to other (i.e. B to H). It shows peak at 'A' point.

Conclusion-

Plant growth is better observed in ashes prepared with brown rice, cow ghee, copper pot, with mantra and at sunrise, sunset timings.

The combination of brown rice, cow ghee and copper pot shows good plant growth.

Higher plant growth is observed in ashes prepared in copper pot, with brown rice and cow ghee, with mantra and performed at sunrise and sunset timings (Ash no. - 1 and 33).